



# First report of the genus *Cladotoma* Westwood, 1837 (Coleoptera, Ptilodactylidae, Cladotominae) in Mexico

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## Abstract

The genus *Cladotoma* Westwood, 1837 (Ptilodactylidae) has seven species distributed in Argentina, Costa Rica, French Guiana, and Panama. *Cladotoma ovalis* Westwood, 1837 is record for the first time in Mexico, in the states of Jalisco and Chiapas. Illustrations, distribution map and a diagnosis for the genus and for *C. ovalis* are herein presented. A checklist of Ptilodactylidae species in Mexico and an identification key for Mexican genera is also presented.

## Keywords

Byrrhoidea, checklist, identification key, Neotropics, toe-winged beetles

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## Introduction

The family Ptilodactylidae, commonly called toe-winged beetles, comprises over 500 described species belonging to 35 genera in five subfamilies: Anchytarsinae Champion, 1897, Cladotominae Pic, 1914, Apoglossinae Champion, 1897, Araeopidiinae Lawrence, 1991, and Ptilodactylinae Laporte, 1836. The family is distributed almost worldwide, and most of the known diversity is found in tropical and subtropical regions (Lawrence 2005). Ptilodactylidae are absent in the Chilean subregion, in Palearctic Region (except in Japan and Italy), Antarctica, and remote oceanic islands (Ivie 2002).

Ptilodactylidae are recognized by their pronotum which is narrowed and rounded anteriorly and has a crenulate base, serrate to ramose antennae, and a cordate scutellum (Stribling 1986; Ivie 2002). Toe-winged beetles live in riparian, semiaquatic and aquatic habitats. Larvae

of some ptilodactylids live in wet rotten wood, leaf litter, gravel, and debris bordering bodies of water, but others live in submerged wood or rotten foliage (Lawrence 2005).

Seven genera are recorded in the Neotropical Region: *Anchytarsus* Guérin-Méneville, 1843, *Aploglossa* Guérin-Méneville, 1849, *Cladotoma* Westwood, 1837, *Lachnodactyla* Champion, 1897, *Lomechon* Wasmann, 1897, *Octoglossa* Guérin-Méneville, 1843, *Ptilodactyla* Illiger, 1807, and *Stirophora* Champion, 1897 (Lawrence 2005). In Mexico, four genera are known to occur: *Anchytarsus*, *Aploglossa*, *Lachnodactyla*, and *Ptilodactyla* (Stribling 1986; Champion 1897). We newly report the presence of *Cladotoma ovalis* Westwood, 1837 in Mexico, provide a diagnosis and illustrations for the genus and species, as well as a distribution map for the species. We present an

updated checklist of the 36 species and the five genera found in country (Table 1), and we provide an identification key to the genera of Ptilodactylidae in Mexico.

## Methods

Two specimens of *Cladotoma ovalis* were found among material deposited in the Colección Nacional de Insectos (CNIN), Institute of Biology, UNAM (S. Zaragoza), México. Stribling (1986) was used to identify the genus. The species was identified using the original description (Westwood 1837) and compared with the illustrations by Costa et al. (1999). Morphological terminology used in this study follows Stribling (1986).

The specimens were examined using a Carl Zeiss Discovery V8 stereomicroscope. Photographs were made using a Zeiss Axio Zoom V-16 stereoscopic microscope equipped with an Axiocam MRC5 camera. For each final image, several photographs were taken at different focal planes and combined using ZEN 2 (blue edition) software to obtain one synthesized photograph. The map was created using ArcGIS online (Esri 2020). Previous records of the species were taken from GBIF (2020), OSU (2020), and from the literature (Table 2). For those records without geographical coordinates we used Google Earth to locate the approximate collection site, and the type locality of *C. ovalis* was recorded in the main city (Brasilia).

**Table 1.** Checklist of the species of Ptilodactylidae, recorded in Mexico (Stribling 1986; Champion 1897).

Taxon	Distribution
<b>Anchytarsus Guérin-Méneville, 1843</b>	
<i>Anchytarsus palpalis</i> (Champion, 1897)	Mexico (Chiapas, Oaxaca, Veracruz, Tabasco) Belize, Brazil, Colombia, Costa Rica, Ecuador, Guatemala, Nicaragua, Panama
<b>Aploglossa Guérin-Méneville, 1849</b>	
<i>Aploglossa marginata</i> Guérin-Méneville, 1849	Mexico
<b>Cladotoma Westwood, 1837</b>	
<i>Cladotoma ovalis</i> Westwood, 1837	Mexico (Jalisco, Chiapas); new record
<b>Lachnodactyla Champion, 1897</b>	
<i>Lachnodactyla monticola</i> Champion, 1897	Mexico (Guerrero), Guatemala
<i>Lachnodactyla parviscutum</i> Champion, 1897	Mexico (Veracruz), Costa Rica, Guatemala
<i>Lachnodactyla texana</i> Schaeffer, 1906	Mexico, USA (Texas)
<b>Ptilodactyla Illiger, 1807</b>	
<i>Ptilodactyla brevicollis</i> Champion, 1897	Mexico (Veracruz)
<i>Ptilodactyla brunneonotata</i> Pic, 1916	Mexico
<i>Ptilodactyla canaliculata</i> Champion, 1897	Mexico (Tabasco), Guatemala
<i>Ptilodactyla confinis</i> Champion, 1897	Mexico (Chiapas, Tabasco, Veracruz), Belize, Guatemala, Nicaragua, Panama
<i>Ptilodactyla convexa</i> Champion, 1897	Mexico (Tabasco, Veracruz), Nicaragua
<i>Ptilodactyla convexicollis</i> Champion, 1897	Mexico (Tabasco, Veracruz), Belize, Guatemala
<i>Ptilodactyla corvina</i> Champion, 1897	Mexico (Veracruz)
<i>Ptilodactyla cucullata</i> Champion, 1897	Mexico (Tabasco), Belize, Guatemala, Honduras
<i>Ptilodactyla debilis</i> Champion, 1897	Mexico (Guerrero), Guatemala
<i>Ptilodactyla deleta</i> Champion, 1897	Mexico (Guerrero, Tabasco, Veracruz)
<i>Ptilodactyla denticulata</i> Champion, 1897	Mexico (Puebla, Veracruz), Costa Rica, Guatemala
<i>Ptilodactyla ebenina</i> Champion, 1897	Mexico (Veracruz), Guatemala, Panama
<i>Ptilodactyla forcipata</i> Champion, 1897	Mexico (Guerrero, Morelos)
<i>Ptilodactyla forticornis</i> Champion, 1897	Mexico (Guerrero)
<i>Ptilodactyla granulicollis</i> Champion, 1897	Mexico (Veracruz)
<i>Ptilodactyla humerosa</i> Champion, 1897	Mexico (Tabasco), Antilles
<i>Ptilodactyla integra</i> Champion, 1897	Mexico (Veracruz), Guatemala
<i>Ptilodactyla lutescens</i> Champion, 1897	Mexico (Tabasco), Guatemala
<i>Ptilodactyla maculata</i> Champion, 1897	Mexico (Tabasco), Guatemala, Panama
<i>Ptilodactyla marginata</i> Champion, 1897	Mexico (Chiapas, Tabasco), Guatemala
<i>Ptilodactyla mexicana</i> Champion, 1897	Mexico (Veracruz)
<i>Ptilodactyla obovata</i> Champion, 1897	Mexico (Veracruz)
<i>Ptilodactyla particularicornis</i> Pic, 1924	Mexico
<i>Ptilodactyla pruinosa</i> Champion, 1897	Mexico (Veracruz)
<i>Ptilodactyla punctatissima</i> Champion, 1897	Mexico (Veracruz), Guatemala
<i>Ptilodactyla rugulosa</i> Champion, 1897	Mexico (Veracruz)
<i>Ptilodactyla sallei</i> Pic, 1924	Mexico
<i>Ptilodactyla subparallelia</i> Champion, 1897	Mexico (Veracruz)
<i>Ptilodactyla sulcata</i> Champion, 1897	Mexico (Oaxaca)
<i>Ptilodactyla tabascoana</i> Champion, 1897	Mexico (Tabasco)
<i>Ptilodactyla tropicalis</i> Champion, 1897	Mexico (Veracruz), Guatemala, Nicaragua, Panama

## Results

### Key to the Mexican genera of Ptilodactylidae

(Adapted from Stribling 1986)

- 1a. Prothoracic trochantins exposed; claws simple .... 2
- 1b. Prothoracic trochantins not exposed; claws usually bifid or with large basal tooth ..... 3
- 2a. Tarsus with proximal four tarsomeres similar in structure; fifth nearly as long as others combined; antennae slightly serrate; labrum not transverse .. .... *Anchytaurus Guérin-Méneville*
- 2b. Tarsomere IV reduced and III lobed ventrally; antennae pectinate with broadly flattened rami (males) or strongly serrate; labrum transverse ..... *Cladotoma Westwood*
- 3a. Apical maxillary palpomere longer than remaining basal palpomeres, males with longitudinal furrow in apical maxillary palpomere, in females without furrow ..... *Lachnodactyla Champion*
- 3b. Apical maxillary palpomere shorter than remaining basal palpomeres, males and females without furrow in apical maxillary palpomere ..... *Ptilodactyla Illiger*

### Genus *Cladotoma* Westwood, 1837

This genus currently has seven described species, and it can be recognized by the following characters: morphology of the head with a transverse occipital ridge; mandibles well developed and bidentate; labrum transverse, maxillary palpomere 4-articulated, palpomere IV subtriangular; labial palpomere 3-articulated; the

characteristics of pronotum with lateral carinae complete, posterior edge crenulate, lateral pronotal margination complete; and by the aspect of the tarsi which is pentamerous; tarsomere IV reduced; tarsomere III lobed ventrally; claws simple (Stribling 1986).

### *Cladotoma ovalis* Westwood, 1837

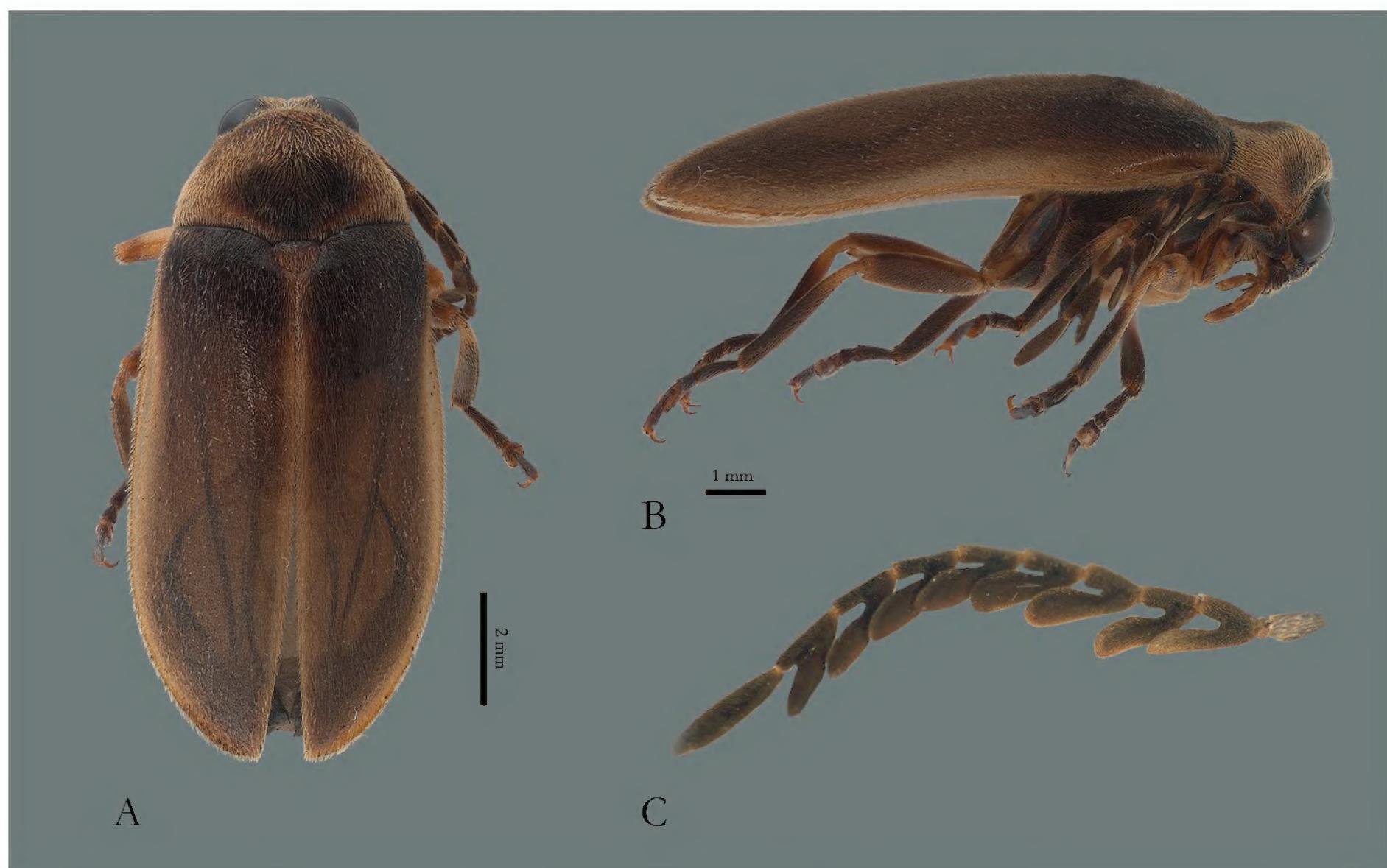
Figure 1

**Material examined.** MEXICO • 1 ♂; Jalisco, Estación de Biología Chamela; 19.5027°N, 105.0394°N; 100 m a.s.l.; 9 Aug. 1985; R.A. Usela leg.; light trap; CNIN 0001 • 1 ♂; Chiapas, Ocozocuautla, Reserva el Ocote, Las Palmas; 17.1045°N, 093.5320°N; 200 m a.s.l.; 8–13 Jun. 1994; B. Gómez leg.; CNIN 0002.

**Identification.** Body oval, pubescent, finely punctate, brownish. Head with black eyes; mandible black at apex; antennae flabellate, fulvous. Pronotum with a posterior depression. Elytra convex, lateral margins rounded, fulvous with yellow sutures and yellow at margins. Femur yellow; tibiae and tarsomeres fulvous.

This species can be distinguished from *Cladotoma bruchii* Fairmaire, 1904 which has the elytra punctate striate; from *C. maculicollis* Fairmaire, 1904 which has the elytra punctate striate and a punctate line near the elytral suture; from *C. marginata* Pic, 1933 which has the pronotum with a depression at the middle and the elytra brownish-yellow; from *C. subvittata* Guérin-Méneville, 1861 which has serrate antennae; and from *C. thoracica* Guérin-Méneville which is completely black.

**Geographical distribution** (Fig. 2; Table 2). BRAZIL (Brasilia, Espírito Santo, Mato Grosso, São Paulo),



**Figure 1.** *Cladotoma ovalis* Westwood, 1837. A. Dorsal habitus. B. Lateral habitus. C. Right antenna.



**Figure 2.** Distribution of *Cladotoma ovalis* Westwood, 1837. Pink star is the type locality. Yellow dots are new records, red dots are the known geographic distribution records based on literature, GBIF (2020), and OSU (2020). The numbers correspond to the localities in Table 2.

**Table 2.** *Cladotoma ovalis* Westwood, 1837 records (19 known specimens) including type locality (#) historic and new records (\*). Colección Nacional de Insectos, Instituto de Biología, UNAM (CNIN); Museu de Zoologia, Universidade de São Paulo: MZSP; Oxford University Museum of Natural History: OUMNH; CA Triplehorn Insect Collection, The Ohio State University: OSUC.

No.	Country	Province/state	Locality	Latitude	Longitude	Reference	Identified by	Collection
1	Brazil	São Paulo	Cubatão	23.9062°S	046.486°W	Costa et al. 1999	—	MZSP
2	Brazil	São Paulo	Piraju	23.1908°S	049.3777°W	Costa et al. 1999	—	MZSP
3	Brazil	São Paulo	Itu	23.1461°S	047.6805°W	Costa et al. 1999	—	MZSP
4	Brazil	São Paulo	Piracicaba	22.7167°S	047.6333°W	OSU.EDU 2020	Stribling, J.B.	OSUC
5	Brazil	Espírito Santo	Parque Sooretama	19.0321°S	040.1097°W	Costa et al. 1999	—	MZSP
6	Brazil <sup>#</sup>	Brasilia	—	15.7797°S	047.9297°W	Westwood 1837	—	OUMNH
7	Brazil	Mato grosso	Xingú	11.9086°S	053.5429°W	Costa et al. 1999	—	MZSP
8	Costa Rica	Puntarenas	Golfito	08.5628°N	083.499°W	GBIF 2020	—	INBio
9	Panama	Panama	Las Cumbres	09.0833°N	079.5333°W	OSU.EDU 2020	Stribling, J.B.	OSUC
10	Panama	Panama Oeste	Barro Colorado Island	09.1547°N	079.8481°W	OSU.EDU 2020	Stribling, J.B.	OSUC
11	Costa Rica	Puntarenas	Aguirre	09.3877°N	084.1328°W	GBIF 2020	Ivie, M.A.	INBio
12	Costa Rica	Puntarenas	Tárcoles, Estación Quebrada Bonita	09.7674°N	084.6081°W	GBIF 2020	Ivie, M.A.	INBio
13	Costa Rica	Puntarenas	Garabito, Reserva Biol. Carara	09.7742°N	084.6081°W	GBIF 2020	Ivie, M.A.	INBio
14	Costa Rica	Limon	Colorado	10.5942°N	083.7165°W	GBIF 2020	Ivie, M.A.	INBio
15	Costa Rica	Guanacaste	Sector Las Pailas	10.7767°N	085.3519°W	GBIF 2020	Ivie, M.A.	INBio
16	Costa Rica	Guanacaste	Liberia, Parque Nacional Sta. Rosa	10.8364°N	085.6154°W	GBIF 2020	Ivie, M.A.	INBio
17	Costa Rica	Guanacaste	La Cruz, Parque Nacional Sta. Rosa	10.8563°N	085.6119°W	GBIF 2020	Ivie, M.A.	INBio
18	Costa Rica	Guanacaste	Finca Jenny	10.8655°N	085.5735°W	GBIF 2020	Ivie, M.A.	INBio
19	Mexico*	Chiapas	Reserva el ocote, Las palmas	17.1045°N	093.532°W	This publication	Rodríguez-Mirón, G.M.	CNIN
20	Mexico*	Jalisco	Estación de Biología Chamela	19.5027°N	105.0394°W	This publication	Zurita-García, M.L. & López-Pérez S.	CNIN

MEXICO new records (Chiapas, Jalisco), PANAMA (Panama), COSTA RICA (Guanacaste, Limón, Puntarenas) (Westwood 1837; Costa et al. 1999; GBIF 2020; OSU.EDU 2020).

## Discussion

Westwood (1837) proposed *Cladotoma* for *C. ovalis* from Brasília, Brazil. This genus was subsequently

recorded from Argentina and French Guiana. Thus, *Cladotoma* was considered a typically South American genus. However, there are records from Costa Rica and Panama (GBIF 2020; OSU 2020), and we report it from the Mexican Pacific Coast (Jalisco) and southern Mexico (Chiapas), with a distance of approximately 1700 km between these Mexican records. The record from Chamela, Jalisco, is the new northernmost known limit for the

species, at about 7,300 km from the type locality (Fig. 2).

The distribution of *C. ovalis* distribution in Mexico agrees with the typical Neotropical distributional pattern of the Mexican entomofauna, which is basically represented by widespread genera of South America, where this fauna originally evolved (Halffter 1976, 1987, 2003). Typical Neotropical species are delimited more ecologically than geographically (Halffter 1976, 1987, 2003), because these species are found in lowland tropical forests in Mexico along the coasts of the Gulf of Mexico and the Pacific Ocean (Halffter and Morrone 2017). One example is *Canthon indigaceus* LeConte (a member of the *Canthon (Glaphyrocanthon) viridis* species group; Scarabaeidae) (Halffter and Morrone 2017) and the genera *Mastothetus* Lacordaire, 1845, *Agathomerus* Lacordaire, 1845, and *Megalopus* Fabricius, 1801 (Megalopodidae) (Rodríguez-Mirón 2018).

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## Authors' Contributions

GMRM found the specimens at the CNIN. GMRM, MLZG, and SLP identified the species. GMRM produced the photographs and map. SLP, DEDL, MGR, VVB, and PCR searched the literature and constructed the checklist (Table 1). All authors wrote the manuscript, revised it, and discussed the data.

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